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# Red Angkak Effects (Monascus Purpureus) to the Platelet Enhancement of Patients with Dengue Fever in Lontara IV Care Unit in RSUP DR. Wahidin Sudirohusodo Makassar

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**Abstract :** The supportive therapeutic use on Dengue Hemorrhagic Fever (DHF) is currently a trend in society, while empirical data regarding the safety of its use is not yet complete, so the researchers wanted to see how the effects of the use of red *angkak* to the patients (DHF).
The aim of research was to determine the effect of the use of red *angkak* to increase platelets in patients with DHF.
The research method was a quasi-experimental, samples were consisted of 15 people as experimentalal group and 15 people as the control group, they also consumed 500 cc / day for 7 days while assessing changes in platelets.
Data were obtained by paired student T test, the results of the research found changes in the levels of platelets before and after administration of red *angkak* fluid with average of the value before (92666.67) to platelets 1 became (112,600.00) with an average increase of 19933 ( 21.51%)with p: 0.005. Furthermore, the average change from its number before to platelets 2 was (127,000.00) with an average increase of a prior of 34 333 (37.04%) with p: 0.000, and the average change from its number before to become a platelet 3 was (145 466, 67) with an average increase before amounted to 52 800 (56.97%) with p:0.000, and the last change in the average of prior to becoming platelets 4 was
(154,833.33) with an average increase before amounted to 63 166 (68, 16%) with p:0.002. This indicated a significant effect of fluid therapy with red *angkak* fluid.
The conclusion showed the use of red *Angkak* as supportive therapy to patients with DHF can be continued because in addition it was not interfere with the principle of therapy that has been done, but it can also help speed up the return of hemodynamics.
Suggestions of this research is requirements for clinical trial or non clinical trials to see more accurate aspect that react chemically in the body.
**Keywords :** Dengue Hemorrhagic Fever, Red *Angkak*, Platelet.

## Introduction

The incidence of dengue worldwide reached 390 million people infected each year generally exposed to the tropical regions. (1), it is exacerbated by endothelial damage causing leakage of plasma which can lead to hypovolemic shock (2) and other complications are more severe, including hemorrhage (2).

Results of invitro studies showed that *lovastatin* can reduce dengue because it can stabilize vascular endothelial dysfunction and *statin*s may modulate dengue vaskulopathy, so that *statin* may be able to have antiviral properties. (3, 4)

*Angkak* product was made by fermentation of rice by Monascus Purpureus. The product of this dye color has been widely used in Asian countries, especially Japan, China, Taiwan, Thailand and the Philippines to provide an attractive red color in certain fermented products, such as red wine, cheese, red soybeans and fish sauce. ( 5, 6)

One of the biochemical content of red *angkak* is *lovastatin* which can increase platelets and helps fighting the dengue virus. (7) *Lovastatin* is also known as cholesterol-lowering agents. In the mechanism of cholesterol-lowering, *lovastatin* lowers bad cholesterol (LDL) with its oxidation. LDL oxidized with and megakaryocyte chemotactic protein - 1 stimulate the regeneration of the endothelium room and turn each into macrophages and activated platelets. These macrophages and platelets fight the dengue virus and then eliminate it. (7)

In addition to increase the number of platelets and the function of macrophages, *angkak* with its *lovastatin* can also donate ubiquinone and heme- A which are important to increase cell energy and repair of red blood cells. Both of these are very important in support the healing process dengue fever. (8)

## Material and Methods

### The research design

Used in this study was Quasy- experimental, where this draft seeks to reveal a causal relationship by engaged the control group and the experimentalal group. In this design, the experimentalal group was treated while the control group was not given treatment.

### This research was conducted

At RSUP.DR. Wahidin Sudirohusodo in Lontara IV Care Unit. The study population was all patients with dengue hemorrhagic fever that treated within a specified timeframe. Samples taken are dengue patients treated in Lontara IV who were diagnosed by stage II DBD appropriated diagnostic workup.

### Research procedures,

A diagnostic test was done to help diagnose dengue positive. Identify the type of treatment given patients for example drug therapy, the type of fluid and the use of alternative therapies *angkak* type liquid red substance that has been extracted from red rice that had been boiled and the last was following the development of both the patient and the general state of platelets change results. Data were tabulated according to age, gender, type of medication, type of fluid, and the use of red *angkak* substance.

### Data Analysis.

Data were analyzed statistically using the Paired t Test.

## Result and Discussion.

From the results of a study of 30 patients with DHF Grade II as research subjects (15 control - 15 experimental), found significant difference in platelet value changes faster in the experimentalal group compared with the control group (graph 1). Where it was consistent with the results of interventions that have been performed by administering fluids to drink red substance *angkak* 500 cc per day in the group treated subjects during follow up showed an improvement of platelets results supported the clinical picture.

While the results of statistical analysis using paired T test showed the control group of platelets pre value to the platelets of 4 decreased from day 1 to day 5. This indicated that in every patient given parenteral fluid therapy and medications were the same, the level of hemodynamic function returning of the body was aided by the presence of some chemical content of the red substance at the molecular level *angkak* included *lovastatin*. This suggested a significant effect with red *angkak* fluid therapy in patients with DHF Grade II with p <0.005. From these data, it can be said that the red substance *Angkak* can help speed up the process of improvement of circulation mainly on the improvement of platelets in patients with dengue fever dengue.Tabel 1-2.

**Graphic 1**

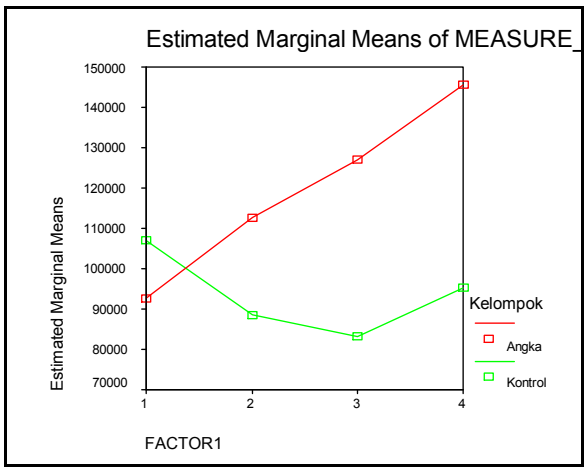


**Table 1 Distribution Change Average - Average Value Platelets in the Experimental Group**

| Experimental Group | N | Mean | Deviation Standard | Enhancement | | Paired T Test (p) |
|---|---|---|---|---|---|---|
| | | | | Average | % | |
| Platelet before and after (Plt 1) | 15 | 92666,67<br>112600,00 | 29310,32<br>38433,24 | 19933 | 21,51 | 0,005 |
| Platelet before and after (Plt 2) | 15 | 92666,67<br>127000,00 | 29310,32<br>38827,45 | 34333 | 37,04 | 0,000 |
| Platelet before and after (Plt 4) | 15 | 92666,67<br>145466,67 | 29310,32<br>38862,15 | 52800 | 56,97 | 0,000 |
| Platelet before and after (Plt 4) | 15 | 92666,67<br>154833,33 | 29310,32<br>46700,82 | 63166 | 68,16 | 0,002 |

Primary Data Sources

**Table 2 Distribution Change Average - Average Value Platelets in the Control Group**

| Control Group | N | Mean | Deviation Standard | Enhancement | | Paired T Test (p) |
|---|---|---|---|---|---|---|
| | | | | Average | % | |
| Platelet before and after (Plt 1) | 15 | 107133,33<br>88400,00 | 33570,53<br>36531,39 | -18733,3 | 17,48 | 0,002 |
| Platelet before and after (Plt 2) | 15 | 107133,33<br>83333,33 | 33570,53<br>30576,99 | -23800,0 | 22,21 | 0,015 |
| Platelet before and after (Plt 3) | 15 | 107133,33<br>95333,33 | 33570,53<br>36147,84 | -11800,0 | 11,00 | 0,280 |
| Platelet before and after (Plt 4) | 15 | 107133,33<br>103533,33 | 33570,53<br>41716,50 | -3600,0 | 3,36 | 0,784 |

Primary Data Sources

The results of this study were supported by research and were conducted by Lin CP et al 2011, it showed the red rice (Monascus purpureus) was able to stimulate the reduction in TNF-α adhesiveness to the endothelium that trigger inflammation and leakage endothelial aggravating conditions in DHF, and downregulating intracellular ROS, NF-kB activation. (7, 9)

In addition to increase the number of platelets and the function of macrophages, *angkak* with its *lovastatin* can also donate ubiquinone and heme- A which were important in increase cell energy and repair of cells - red blood cells. Both of these were very important in support the healing process of dengue fever. This study was also able to confirm the results that researchers got from the dengue hemorrhagic fever patients stage II indicating faster platelets improvement in experimenal patients compared with patients who were not given the treatment. (3, 4, 10)

Based on the research resulted by Whitehorn J et al, 2012, that the development of dengue fever therapies that can reduce the risk of the death from this disease have made substantial progress in global health. It was through the beneficial effect of *lovastatin* on the endothelium of work, a better safety profile and lower cost made *lovastatin* as an attractive therapy in dengue hemorrhagic fever. (11-13)

## Conclusion

The use of boiled red *angkak* water (Monascus purpureus) can increase platelets in patients with DHF grade 2.

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